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# LITHOTRITY,

AND ITS

## AFTER-TREATMENT.

BY

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CASE I.—PATIENT, AGED SIXTY-THREE YEARS; LITHIC ACID CALCULUS, OF SMALL SIZE; LITHOTRITY; RECOVERY.

CASE II.—PATIENT, AGED FIFTY-NINE YEARS; LITHATE CALCULUS, OF MEDIUM SIZE; LITHOTRITY; RECOVERY.

It will be freely acknowledged that the most brilliant surgical operation proves unsuccessful occasionally, owing to the after-treatment. The many difficulties with which the surgeon has to contend, more or less excuse him for consequences, many of which, very probably, the peculiarities or disobedience of his patient will best explain. Perhaps there is no operation which bears out this statement more forcibly than lithotritry, which is in itself difficult to perform properly, but still is one whose favourable termination may be hoped for more from the judicious subsequent care of the case, than from the most expert manipulative skill during the performance of this triumph in surgery. A stone having been fully crushed in the bladder, it becomes one of the most important parts of the after-treatment of the case to remove all the fragments.

And, as the process of disintegration must be so frequently repeated, lithotriety may, with great propriety, be regarded as a series of operations, each operation or sitting being but a step towards the desired end.

In the February number of this Journal for 1866 I published some observations on crushing stone in the bladder, together with three cases in which this operation had been successfully performed. I am now about to add two additional cases; and in reference to these latter to make some remarks upon a point in the after-treatment of cases of lithotriety, further experience having led me to modify my opinion as expressed on the subject in my former paper. The point to which I allude, is the removal of detritus by washing out the bladder.

CASE I.—A gentleman, aged sixty-three years, put himself under my care on the 11th July, 1866. He had suffered much from irritability of his bladder during the preceding three months, and for the last three weeks of the time he had been greatly annoyed with pain along the under part of the penis, near the glans. He had passed some very small calculi, and occasionally crystals of lithic acid. My friend, Dr. Ledwich, had previously sounded him, and detected the presence of a stone. His urethra was large, freely admitting a No. 13 metallic bougie, and its introduction proved that the canal was not irritable. His prostate was natural, and his general health had not apparently suffered. Assisted by Dr. Ledwich, I placed him lying on a sofa, and introduced Mr. Henry Thompson's flat-bladed lithotrite, for the purpose of measuring the calculus. I was fortunate enough to seize it almost immediately, and ascertained that the diameter in which it was caught measured half an inch. I then serewed home the male blade, and crushed the stone, and shortly afterwards I caught a small fragment, and broke it.

July 13th.—Second sitting. I caught and broke three fragments of small dimensions, and washed out fifteen grains of detritus with Mr. Clover's syringe.

July 17th.—Third sitting. Two fragments crushed, and six grains of detritus removed by Clover's syringe.

July 20th.—Fourth sitting. Four small pieces were broken, and a large fragment was washed out by means of Clover's apparatus.

August 1st.—Fifth sitting. One small piece was seized and broken, some fine detritus removed with Clover's syringe.

It would be useless to note the daily progress of this gentleman's



case. He improved rapidly, all symptoms of his complaint disappeared, and Dr. Ledwich and I were unable to detect any unbroken fragments by careful sounding on the 20th of August. He is now in the enjoyment of excellent health and spirits, and takes a great deal of exercise, frequently driving on an outside car, as much as twenty miles a day, over rough country roads.

Between the sittings detritus came away during micturition, which, together with that brought out in the jaws of the lithotrite and removed by means of Clover's instrument, amounted to seventy-nine grains. In all those cases some portions of the stone must have been lost, owing to the difficulty of separating the fine debris from the urine, and inducing attendants to carefully preserve this fluid for the surgeon's inspection.

CASE II.—A gentleman, aged fifty-nine years, consulted me in August, 1866. He had been suffering from an irritable condition of his bladder for seven years previously, and for the last two years the symptoms assumed a serious and painful character. He was obliged to pass water very frequently, both by day and night. The pain, whilst expelling the last drops of urine, was most severe, and he voided it bloody whenever he either walked a distance, or took carriage exercise.

He had taken a variety of medicines intended to relieve his distressing state, but without any very decided benefit. He had suffered from retention of urine twice within a short time before he came under my care. His health had not given way as much as might have been expected. His urine was highly acid, as ascertained by my friend, Dr. P. C. Little, who saw this gentleman along with me; he also carefully tested it for albumen, and found only a trace, which could be explained by the presence of blood corpuscles. On the 29th of August I sounded him with Thompson's sound, and detected the stone. It measured six-eighths of an inch in diameter.

His urethra was large, and pervious, but rather irritable, from the frequent passage of bougies before I saw him. His prostate gland was of healthy dimensions. He had expelled some small calculi from time to time, two of which, about the size of duck shot, he gave me; their composition, on analysis, was found to be lithate of ammonia.

September 2nd.—Assisted by Dr. Little, I proceeded to crush the stone. I placed the patient lying on his bed, with a pillow under

the nates, and his head comfortably supported with other pillows. I had desired him to keep his urine for two hours previously; but as he was unable to do so, I injected four ounces of tepid water into his bladder. I then introduced Mr. Henry Thompson's flat-bladed lithotrite with ease, quickly seized the calculus, and broke it. Five fragments were subsequently caught, and crushed. Having withdrawn the lithotrite, and introduced Clover's catheter, I attached its syringe, filled with tepid water, and washed out ten grains of detritus. I then gave the patient a glass of sherry, and placed a quarter grain morphine suppository in his rectum; he was put comfortably in bed, with a jar of hot water to his feet.

September 6th.—The second sitting took place. Between this date and the first operation, he passed some fine detritus. On this occasion three fragments were seized, and broken; one of them measured half an inch in diameter. Clover's instrument was also employed, and five grains of detritus removed.

September 12th.—The third sitting. Prior to this sitting he had expelled one large fragment, *per urethram*, by the natural powers.

The fourth sitting took place on the 18th of September. He requested me to administer chloroform, as he felt very nervous, and dreaded the lithotrite, not because he had suffered pain to any great extent, but he felt depressed, and wished for the anesthetic. He was rendered insensible, most carefully and efficiently, by my friend, Dr. Cruise. On this occasion I seized four pieces, and crushed them, and immediately afterwards washed out twelve grains of detritus with Clover's syringe. In the jaws of the lithotrite, also, a good deal of pulverized calculus came away. In the interim between this and the next sitting several fragments of small dimensions passed off.

September 24th.—The fifth sitting. He was again chloroformed for me by Dr. Little. I caught and broke five fragments, and used Clover's syringe with the effect of removing nineteen grains of detritus, some large pieces having come away by this mode of washing out the bladder. I have not detailed the various symptoms from day to day in this case, as such would only weary the reader. Suffice it to say, after this operation he progressed rapidly; all vesical irritation subsided; his health vastly improved, he was able to take several drives into the country, and to retain his water for hours.

Sixth, and last, sitting took place on October 12th, when he was



again chloroformed. I introduced the lithotrite; but the most careful examination of the bladder failed to discover any fragment of the calculus remaining unpulverized, and but two grains of detritus were sucked out with Clover's syringe; the whole quantity removed weighed one hundred grains.

In both the cases just detailed, it will be perceived that I used the flat-bladed lithotrite of Mr. Henry Thompson. Its power is quite sufficient for medium-sized calculi, and its beautiful construction renders it very safe while feeling for, and breaking the stone. The medical treatment consisted in the administration of a liberal allowance of wine, with plenty of beef tea; and, as a general drink, oatmeal tea, which I have found in those cases more soothing to the urinary passages than decoction of linseed, barley, or gum-water. Whenever mucus appeared in the urine after a sitting, I ordered a mixture, containing infusion of buchu with tincture of hyoscyamus and liquor potassæ; and occasionally, small doses of balsam of copaiba. I introduced a quarter-grain morphine suppository into the rectum after each sitting, and also whenever urethral or vesical irritability existed, with the most marked benefit.

It is evident that as soon as a stone within the bladder has been reduced to fragments, it is most desirable that those fragments should be removed as soon as possible. For those who do not employ the scoop, following the practice of Sir William Fergusson, there remain but two means of effecting this object; one method, deprecating interference with the bladder as much as possible, leaves the fragments to the unaided contractile force of the viscus, trusting they may be expelled with the urine in due time; the other plan, and more trustworthy one, endeavours to promote their removal by washing out the bladder with a strongly-injected stream of water, expecting the return current to carry out much of the detritus stirred up in the bladder. It must, however, have been observed by practical surgeons how often the amount of detritus removed in this way has disappointed their expectations; and it was the failure of the means which I then had at my disposal to remove detritus, which obliged me in my last paper on lithotrity, to place little value on the practice of washing out the bladder. The water thrown in with the ordinary evacuating catheter and syringe returns with but *little* force, particularly in cases in which the tone of the organ has been in a great measure weakened or lost. It has always been a desideratum to supplement the force of the bladder in the

removal of detritus. The late Sir Philip Crampton saw the necessity of some efficient means of doing so, and not only suggested but employed a most ingenious contrivance, which, in my student days, I saw him use in the Meath Hospital, and which is well described in the number of this Journal for January, 1846, page 22, in the following words:—"The apparatus consists of a strong glass vessel of an oval form, and six or eight inches in length, by three in diameter, and capable of holding about a pint and a-half of water; to this vessel is attached a tube of about half an inch bore, furnished with a stop-cock. The air being exhausted by means of an exhausting syringe, and one of Heurteloup's wide-eyed steel evacuating catheters being introduced into the bladder, it is next attached to the exhausted vessel; the stop-cock is then turned, and a communication being thus established between the bladder and the glass, the pressure of the atmosphere is by this means brought to bear on the bladder, and supplies an expulsive power, which may be increased to any required amount." Figure 4, plate I, gives a tolerably accurate idea of this instrument. It has been drawn from the *original* one, which my colleague, Mr. P. C. Smyly, kindly placed at my disposal for that purpose.

The instrument of Mr. Clover, of London, for injection of the bladder, and withdrawal of the injected liquid by *suction*, is such an improvement upon the former means of removing debris by injection, that having found the advantages its employment affords in speedy and safe removal of the fragments of calculi, I consider its use an important auxiliary in the after-treatment of lithotrity. It must be admitted that there can be no more important element in the after-management of a case of lithotrity, or a point more conducive to the success of the operation, than early removal of the detritus, and without injury to the prostate or urethra; and improvements in the surgical appliances for lithotrity are to be much encouraged in this direction as well as in the means of primary comminution of the calculus. By crushing the stone, in the first instance, a comparatively smooth and single calculus is converted into several angular and irregular stones; the bladder, moreover, having become more or less irritated by instrumental interference, the patient is not much better off than he was before the operation. His hopes of relief, therefore, rather depend on the removal of the crushed fragments. Every practical lithotritist will bear me out in saying that the delight of a patient is most remarkable when he sees the fragments; and, on the contrary, his

spirits are depressed when the debris is tardy in making its appearance. I have found the instrument devised by Mr. Clover (to whom the profession is also indebted for an apparatus for the safe administration of chloroform) most efficacious in removing any fragments sufficiently reduced in size to pass through the large catheter attached to his syringe. For those who may not have had an opportunity of seeing it, I have added a drawing, Plate I., Fig. 3; and in explaining it I think I can best do so by quoting Mr. Clover's own description, as given in his letter in *The Lancet* for May 12th, 1866. He says:—"My instrument consists of a glass cylinder two inches long and two inches wide, having an eight-ounce India rubber ball at one end, and a vulcanite mount at the other, in which is a hole which fits closely to a collar fixed just above the rings of the catheter, so as to allow the catheter to project three quarters of an inch inside the glass vessel."

The instrument that I have been in the habit of using was procured for me from Weiss, of London, by Messrs. Fannin, of Grafton-street. It differs from, but possesses advantages over, that described by Mr. Clover, namely, the mount is of brass attached to the glass, and to it is *screwed* on the stopper, which has a tube, Fig. 3, the calibre of a No. 12 catheter, fixed to it, and extending into the cylinder about three quarters of an inch. This arrangement renders it unnecessary for the catheter to project into the glass portion of the instrument, and allows the apparatus to be attached to, and detached from the catheter with greater ease.

It has been proposed by my friend Mr. Fleming to improve the instrument by adding an offset to the glass part, resembling that of the ordinary breast-pump—*vide Dublin Quarterly Journal of Medical Science* for February, 1866, and by Mr. Maunders—*vide London Hospital Reports*, Vol. III., 1866, page 216. The late Sir Philip Crampton was not unmindful of this addition to his instrument, as will be seen. Plate I., Fig. 1, shows a glass receptacle attached to the brass tube united to a copper cylinder, which he had constructed to bear greater exhaustion than the glass one. I confess that, although ingenious, I cannot see the advantages of such an offset to the glass portion of Mr. Clover's syringe. When the end of the catheter extends sufficiently into the cylinder it renders it most difficult, if not impossible, to force back any fragment that may have been sucked into the instrument. Indeed, in practice I have found that a good deal of debris remains in the



India rubber portion of the apparatus instead of the glass, and certainly if it ever passes beyond the projecting portion of the catheter into the glass it will be retained just as well as with the offset. To the practical surgeon I consider this instrument of Mr. Clover's a great boon, not only to remove detritus after lithotrixy, for which he suggested it, but also for the removal of clots of blood from the bladder, as I myself lately found it most efficient in a case of bleeding into this organ, arising from diseased prostate. The catheter should be of the size of No. 12, with a large eye in the concavity of its curve, and provided with a stilette made of gum-elastic (Plate I., Fig. 2), to fill this aperture during its introduction and withdrawal.

The fragments of the calculus removed by lithotrixy in the first case were analyzed by my friend Dr. William Daniel Moore, who stated that it was composed of lithic acid. It is unusual, at an advanced period of life, to find a calculus wholly or so largely composed of lithic acid, although in some or other of its salts it is one of the most usual ingredients of all calculi. But while there is no age exempt from the occurrence of urinary concretions, into which lithic acid enters largely, they are, perhaps, more associated with the urinary diseases of earlier than of later life. With this form of calculus there are certain advantages in the performance of lithotrixy; there is less apprehension of delay and tediousness in the secondary crushings, because the absence of phosphatic salts indicates an integrity of the mucous membrane of the bladder, and an acid rather than an alkaline condition of the urine, both of which circumstances very much promote the success of any operation implicating the interior of the bladder. In cases where there is reason to believe lithic acid, or its salts, to be undergoing deposition in the bladder, it is dangerous to render the urine alkaline in the hopes of interrupting the formation of a calculus, on account of the tendency which the phosphates exhibit of forming in layers round lithic acid calculi. As soon as the urine is made alkaline, although the deposition of lithic acid may be checked, a layer of triple phosphate will replace it, and the calculus will increase in size as rapidly, if not more so, than before. In the after-treatment of cases of lithic acid calculus it is of importance to prevent a re-deposition in the bladder of this ingredient of the urinary excretion, which will be very liable to occur if the diathesis be not combated. With regard to the urine, it is not necessary to render it more than neutral, for which purpose the waters of Vichy

and the carbonate of lithia are well adapted. It is to be borne in mind that should it be rendered alkaline the phosphates are ever ready to take advantage of a small hemp-seed or pin-head particle of gravel, and upon it, as a nucleus, to initiate a rapidly-growing stone. The object of keeping the urine neutral is to keep the lithic acid in a soluble condition until after its removal from the body. It is also most important to keep the action of the skin healthy, as it has been ascertained that the quantity of lithic acid in the urine is augmented when the cutaneous transpiration is interfered with. Warm clothing, the wearing of flannel or chamois leather next the skin, occasional diaphoretics, and the use of the vapour bath, are means of warding off the excessive formation and deposition of lithic acid concretions which will be worthy of attention after the removal of a calculus of this description. At the same time it will be necessary to endeavour to restore the proper tone of the organs of digestion, and to combat any peculiar form of dyspepsia which may be present, since the lithic acid diathesis is so much due to defective primary assimilation.



